Amendments to the Specification

Please amend the specification as follows.

Please amend the paragraph beginning at page 3, line 25, as follows:

Fig. 1B is a cross sectional view of the angular velocity sensor at line 1B-1B shown in Fig. 1A. Each of drive units 2 includes drive electrode 2A formed on vibrating arm 1a, piezoelectric layer ~~2C~~ 2B formed on drive electrode 2A, and drive electrode ~~2B~~ 2C formed on piezoelectric layer ~~2C~~ 2B. Drive units 2 extend in a direction from lower end 101a to upper end 102a of vibrating arm 1a. Detection unit 3 includes detection electrode 3A formed on vibrating arm 1a, piezoelectric layer 3C formed on detection electrode 3A, and detection electrode 3B formed on piezoelectric layer 3C. Detection electrode 3B extends in the direction from lower end 101a to upper end 102a of vibrating arm 1a. Detection electrode 3B has a length substantially equal to that of drive electrode ~~2B~~ 2C.

Please amend the paragraph beginning at page 4, line 9, as follows:

Detection unit 13 includes detection electrode 13A formed on vibrating arm 1b, piezoelectric layer 13C formed on detection electrode 13A, and detection electrode 13B formed on piezoelectric layer 13C. Monitor unit 4 includes monitor electrode 4A formed on vibrating arm 1b, piezoelectric layer ~~4C~~ 4B formed on monitor electrode 4A, and monitor electrode ~~4B~~ 4C formed on piezoelectric layer ~~4C~~ 4B. Dummy unit 8 includes dummy electrode 8A on vibrating arm 1b, piezoelectric unit ~~8C~~ 8B on dummy electrode 8A, and dummy electrode ~~8B~~ 8C on piezoelectric unit 8.

Please amend the paragraph beginning at page 4, line 20, as follows:

A voltage is applied between drive electrodes 2A and ~~2B~~ 2C of drive units 2 causes vibrating arm 1a to vibrate in X-axis direction 6, thereby causing vibrating arm 1b to resonate with this vibration and to vibrate at the same frequency as vibrating arm 1a. Monitor electrodes 4A and ~~4B~~ 4C of monitor unit 4 output signals corresponding to the amplitudes of the vibrations of vibrating arms 1a and 1b. These signals are fed back to a control circuit which controls the driving voltage to be applied to drive electrodes 2A and ~~2B~~ 2C. Based on the signals fed back, the control circuit controls the frequencies, voltages, and phases of the signals to be applied to

drive electrodes 2A and ~~2B~~ 2C so as to maintain the vibration of vibrator 1. Vibrating arm 1a deflects in the Z-axis direction due to a Coriolis force produced by an angular velocity applied to vibrator 1 around the Y axis, and detection electrodes 3A and 3B of detection unit 3 accordingly output a signal indicating the amount of the deflection of vibrating arm 1a which corresponds to the Coriolis force. Similarly to this, vibrating arm 1b deflects in the Z-axis direction due to a Coriolis force produced by the angular velocity applied to vibrator 1 around the Y axis, and detection electrodes 13A and 13B of detection unit 13 accordingly output a signal indicating the amount of the deflection of vibrating arm 1b which corresponds to the Coriolis force.

Please amend the paragraph beginning at page 5, line 12, as follows:

The angular velocity sensor has driving resistance Rd, a transfer impedance in driving vibrator 1. Driving resistance Rd is defined as the ratio Vd/Im of voltage Vd applied between drive electrodes 2A and ~~2B~~ 2C to current Im generated in monitor electrodes 4A and ~~4B~~ 4C due to the vibration of vibrator 1. In the angular velocity sensor of the embodiment, vibrating arms 1a and 1b of tuning fork vibrator 1 and drive units 2 are designed based on the ratio R1/R2 of value R1 of driving resistance Rd at a fundamental vibration frequency of vibrating arms 1a and 1b in vibration direction 6 to value R2 of driving resistance Rd at a disturbance vibration frequency different from the fundamental vibration frequency. That is, in designing the angular velocity sensor, the sizes of vibrating arms 1a and 1b and drive units 2 are determined based on the ratio R1/R2.

Please amend the paragraph beginning at page 5, line 24, as follows:

Fig. ~~2B~~ 2 shows the relation between the ratio D/L (presented by the horizontal axis) of length D of each of drive electrodes 2A and ~~2B~~ 2C to length L of each of vibrating arms 1a and 1b, and the ratio R1/R2 (represented by the vertical axis) of driving resistances Rd. As shown in Fig. ~~2B~~ 2, the relation between these ratios is similar to a quadratic curve having a minimum value.

Please amend the paragraph beginning at page 6, line 26, as follows:

The ratio R1/R2 is determined to be less than "1" so that vibrating arms 1a and 1b is less affected by disturbance. Therefore, in order to prevent the vibration shown in Fig.3, the ratio

R1/R2 is determined to be less than "1" based on Fig. ~~2B~~ 2 by determining the ratio D/L to satisfy the relation of 0.38<D/L<0.46.

Please amend the paragraph beginning at page 7, line 4, as follows:

In the above description, attention is paid for the relation between lengths D of drive electrodes 2A and ~~2B~~ 2C and length L of vibrating arm 1a. Similarly, lengths D of detection electrodes 3A and 3B may be determined to be 0.38<D/L<0.46.

Please amend the paragraph beginning at page 7, line 21, as follows:

Fig. 1C is a cross sectional view of the angular velocity sensor at line 1C-1C shown in Fig. 1A. Similar to drive units 2 and detection unit 3, auxiliary weight unit 7a formed on vibrating arm 1a includes electrode 107A formed on vibrating arm 1a, piezoelectric layer 107C formed on electrode 107a, and electrode 107B formed on piezoelectric layer 107C. Similar to monitor unit 4 and detection unit ~~4~~ 13, auxiliary weight unit 7b formed on vibrating arm 1b includes electrode 207A formed on vibrating arm 1b, piezoelectric layer 207C formed on electrode 207a, and electrode 207B formed on piezoelectric layer 207C. Auxiliary weight units 7a and 7b have the same structure as drive units 2, detection unit 3, monitor unit 4, and detection unit ~~4~~ 13, thereby allowing all of these units to be formed simultaneously without any additional process. Auxiliary weight unit 7a is separate from drive units 2 and detection unit 3, while auxiliary weight unit 7b is separate from monitor unit 4, detection unit 4, and dummy unit 8.

Please amend the paragraph beginning at page 8, line 8, as follows:

Detection electrode 3B of detection unit 3 may have a length equal to that of drive electrode ~~2B~~ 2C of drive units 2 to align end surface 3D to end surface 2D. This allows end surface 307a of auxiliary weight unit 7a facing end surfaces 3D and 2D to be straight, thereby decreasing the exposing surface of vibrating arm 1a. Similarly, detection electrode 13B of detection unit 13 may have a length equal to that of monitor electrode ~~4B~~ 4C of monitor unit 4 and that of electrode ~~8B~~ 8C of dummy unit 8 to align end surface 13D to end surfaces 4D and 8D, so that end surface 307b of auxiliary weight unit 7b facing end surfaces 13D, 4D, and 8D can be straight, thereby decreasing the exposing surface of vibrating arm 1b.

Please amend the paragraph beginning at page 9, line 16, as follows:

In the angular velocity sensor according to the present embodiment, the length of drive electrode 2A at the uppermost position in drive unit 2 is determined based on the length of vibrating arm 1a. Piezoelectric layer ~~2C~~ 2B and drive electrode ~~2B~~ 2C may have lengths equal to or greater than drive electrode 2A. Only a region in piezoelectric layer ~~2C~~ 2B of drive unit 2 on which drive electrode 2A is formed and to which a voltage is applied contributes to the driving. Therefore, the length of drive electrode 2A at the uppermost position determines an effective area of piezoelectric member ~~2C~~ 2B so as to obtain desired properties.